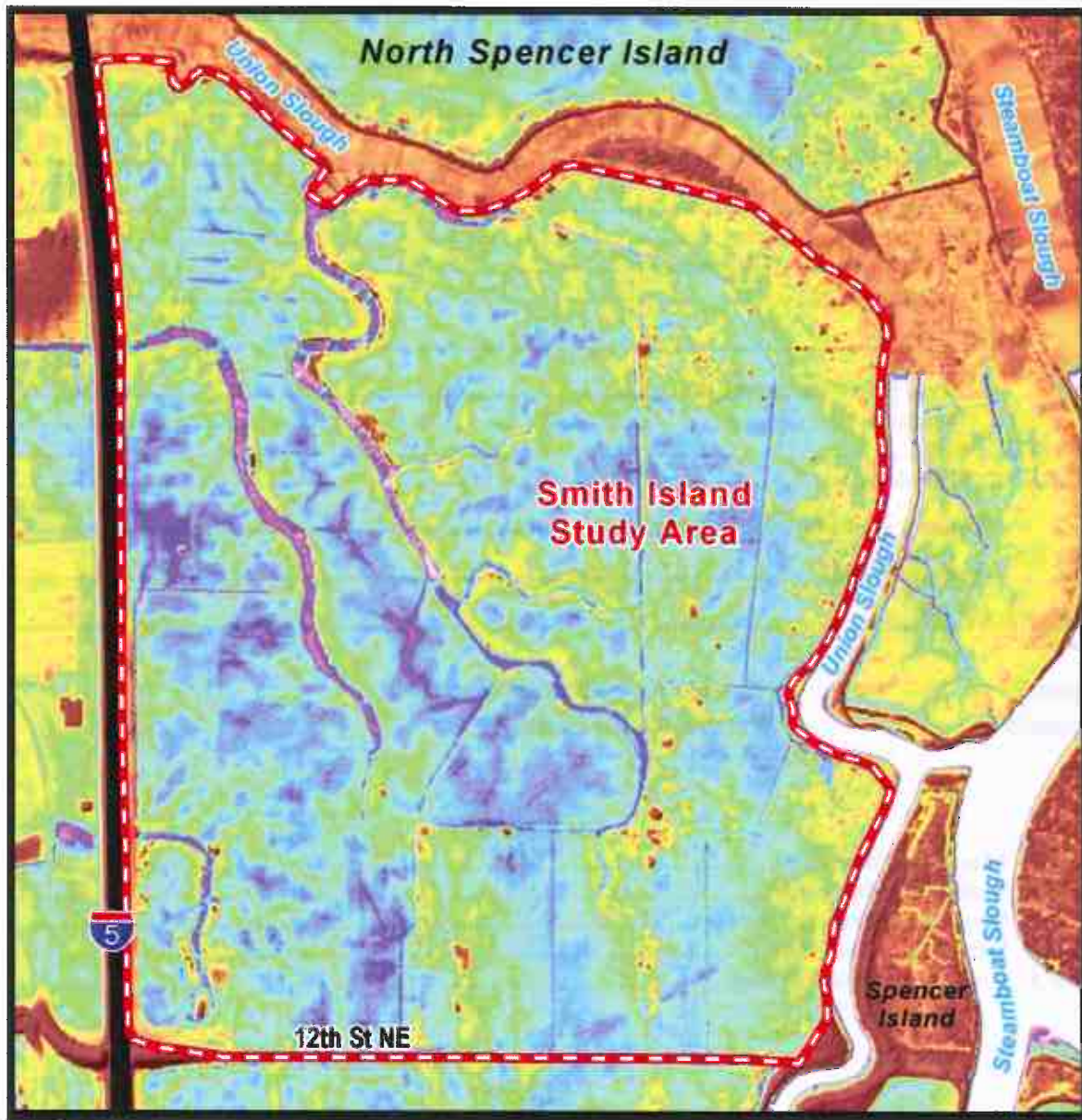


**Smith Island Restoration Project  
(RR-49206)  
Wetland Characterization Report**



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**May 2008**

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>2</b>
1.1	Location.....	2
1.2	Goals.....	2
<b>2.0</b>	<b>METHODS.....</b>	<b>4</b>
2.1	Review of Existing Information.....	4
2.2	Field Investigation.....	4
2.2.1	Wetland Characteristics.....	5
2.2.2	Wetland Boundary Determination .....	6
2.2.3	Wetland Rating .....	7
<b>3.0</b>	<b>RESULTS.....</b>	<b>7</b>
3.1	General Site Characteristics.....	7
3.1.1	Vegetation.....	7
3.1.2	Soils.....	9
3.1.3	Hydrology.....	10
3.2	Wetland Boundary Determination .....	10
3.3	Wetland Rating .....	11
	<b>REFERENCES.....</b>	<b>17</b>

Appendix A	Harnden As-built drain tile plans
Appendix B	Wetland Rating Forms

## FIGURES

Figure 1.	Map of the Project Site .....	3
Figure 2.	Smith Island Study Area.....	8
Figure 3.	Smith Island Drainage Network .....	14
Figure 4.	Smith Island Soils Map .....	15
Figure 5.	Smith Island Wetlands Map.....	16

## TABLES

Table 1.	Key to Plant Indicator Status.....	6
Table 2.	Results of Wetland Rating System Functional Scoring .....	12
Table 3.	Smith Island Wetland Characterization Data.....	13

# Smith Island Wetland Characterization Report

## May 2008

### 1.0 INTRODUCTION

As part of an estuary-wide effort with other regional entities to reestablish tidal marshlands in the Snohomish estuary, Snohomish County Public Works has embarked on a project to reconnect over 400-acres of Smith Island with Union Slough and restore the area to intertidal wetlands (CH2MHILL, 2004).

Throughout the 1980's and 1990's, Smith Island gained notice for potential restoration as a growing awareness among local groups that recognized the unique and valuable habitat estuaries provide (Thom, 1987; City of Everett, 1997). At the end of the 1990's Puget Sound was faced with the Federal Listing of Chinook Salmon under the Endangered Species Act (ESA). In 2001, the Rhode's property on Smith Island was ranked as Snohomish County's highest priority for acquisition through the ESA Priority Lands Acquisitions Program (CH2MHILL, 2004). In late 2001, Snohomish County began purchasing properties on Smith Island.

### 1.1 LOCATION

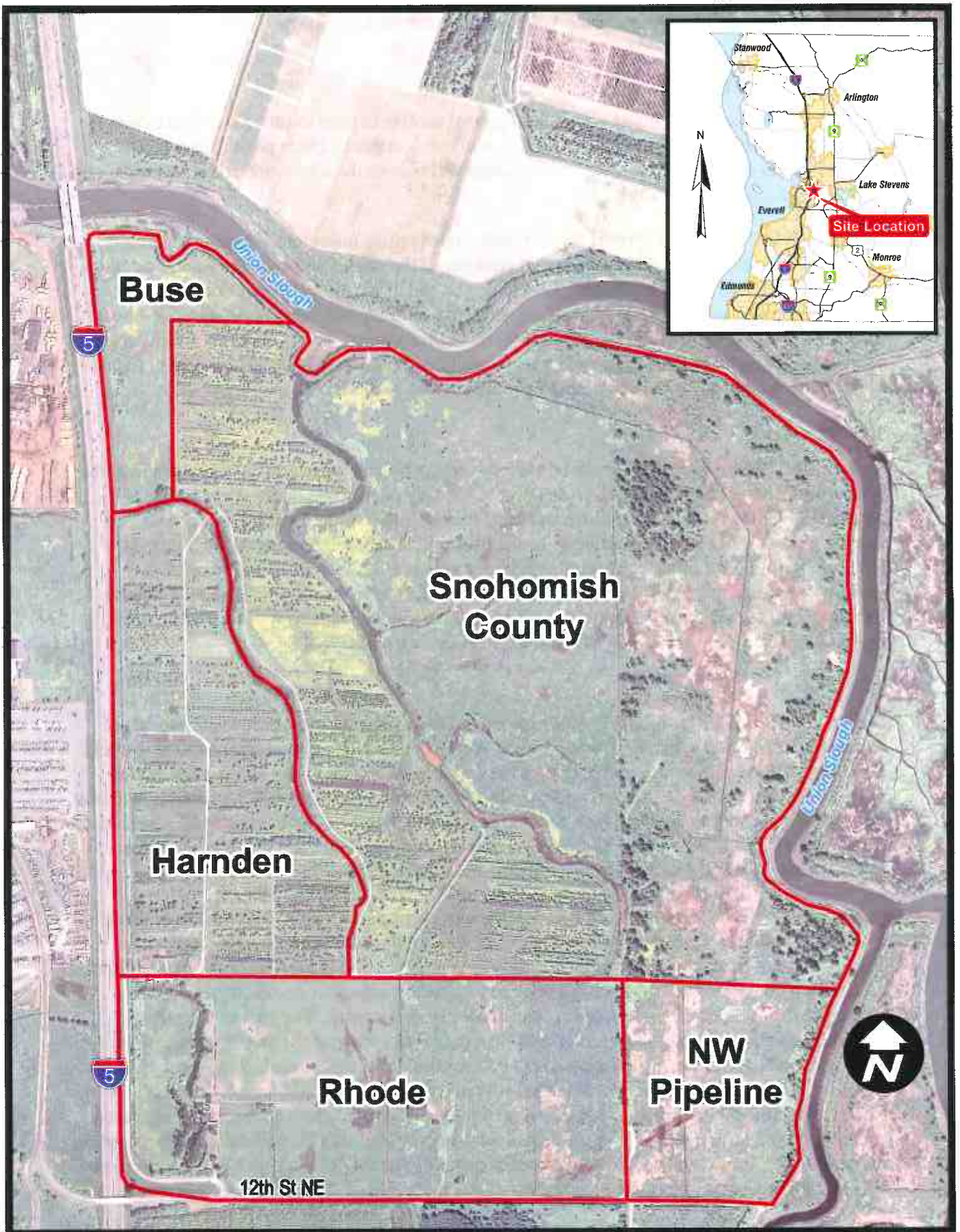
Snohomish County's proposed Smith Island Restoration Project is located on Smith Island in the Snohomish River estuary to the north and east of the City of Everett (Figure 1). The site is bounded by Union Slough to the north and east, Interstate-5 (I-5) to the west, and the City of Everett's wastewater treatment facilities to the south. It is centrally located in the Snohomish River estuary. The proposed project area is comprised of 5 different properties owned or previously owned by Buse Timber Inc., Harnden Family, Rhode Family, Williams NW Pipeline Inc., and Snohomish County (Figure 1). When restored, Smith Island will serve a key role in providing a large contiguous area of restored estuarine wetlands.

### 1.2 GOALS

During the fall and winter of 2006 – 2007, as part of the planning process for the Smith Island Restoration Project, Snohomish County Public Works conducted a reconnaissance level wetland inventory to characterize pre- and post-dike breach wetland conditions on Smith Island in the project area. The goal of this work was to gain a better understanding of site conditions and how those conditions may be affected by breaching the existing dike. Following this work, the project team determined a high level of uncertainty remained as to the extent and location of wetlands, and that a more detailed wetland characterization was necessary.

In March of 2007, a follow up work plan was developed to refine the wetland inventory work, evaluate potential mitigation opportunities and to do a preliminary assessment of what environmental permits are required for the proposed project. The project team felt that sufficient information could be obtained from refining the wetland inventory work, and that a detailed wetland delineation of the entire site was not necessary at this time. The goal of the wetland characterization work and this report is to inform the project team of the extent, type, and rating of the wetlands within the project area. This information will facilitate design and permitting decisions, and allow for further development of mitigation and restoration opportunities. The work conducted did not evaluate whether any of the remnant tidal channels qualify as regulated streams under local critical area regulations or as waters of the state for hydraulic code permitting purposes. This topics will be looked at separately during the proposed project permitting process. This wetland report is one of the deliverables of this work plan.





**Figure 1. Smith Island Project Area**

Smith Island Wetland Characterization Report  
May 2008

## 2.0 METHODS

This wetland characterization report is based on review of existing literature and scientific data, field investigations, and queries of natural resource-related GIS layers (e.g. streams, LIDAR, soils and wetland inventories). This report synthesizes the results of this information to identify and characterize the wetlands in the project area.

### 2.1 REVIEW OF EXISTING INFORMATION

Prior to conducting field investigations for this report, the following sources of information were reviewed to determine if records of wetlands and other water resources exist in the project area.

- *Conceptual Design Report for the Smith Island Restoration Project (CH2MHILL, 2004).*
- *Smith Island Pre and Post Dike Breach Wetland Inventory (Snohomish County, 2006).*
- *National Wetland Inventory Map (U.S. Fish and Wildlife Service, 1988).*
- *Snohomish County Stream and Wetland Survey (Snohomish County Planning and Development Services, 1986).*
- *Soil Survey of Snohomish County Area, Washington (Debose and Klungland, 1983).*
- *Hydrography and Watercourse Databases. GIS data compiled and maintained by Snohomish County Department of Information Services. April 2003 update.*
- *Snohomish Conservation District maps and aerial images of Smith Island.*

### 2.2 FIELD INVESTIGATION

One of the objectives of the field investigation was to refine the wetland inventory work from 2006. The previous wetland inventory work (Snohomish County, 2006) found that the wetland's hydrogeomorphic class is depressional, and at a minimum wetland characteristics were present at elevations below 4 feet<sup>1</sup>. To refine this work, field investigations were conducted to collect soil, plant community and hydrology data.

The field work study area (Figure 2) was limited to the areas within the project area where wetland characteristics were most uncertain and where the team was interested in developing potential mitigation opportunities. The project team determined the entire site was too large and it would be too costly to delineate all of the wetlands. Because large areas of the property currently owned by the County was purchased with funds from a Salmon Recovery Funding Board grant, which does not allow mitigation to be conducted on lands purchased with grant funds, those areas were not included in the study area. Conversely, 100 acres of the proposed project area that was purchased with County Conservation Future funds, which allows for mitigation uses, was the focus area of the study. The remaining parcels in the proposed project area that have yet to be purchased, were also included in the field investigations.

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<sup>1</sup> North American Vertical Datum of 1988 (NAVD88)



## Smith Island Wetland Characterization Report

### May 2008

Prior to conducting field work, a baseline transect parallel to I-5 with perpendicular sampling transects were established to assist with field orientation (Figure 2). This information, along with a recent aerial photo were downloaded onto a Trimble GeoXT GPS unit.

In the field, random sample locations along the transects were selected and surveyed. Additional transects and sample locations were selected and surveyed based on characteristics such as topography and the presence of hydrophytic plant species. Figure 2 shows all transects and sample locations surveyed.

At all sampling locations data were collected for vegetation, soil, and hydrology to determine if the location demonstrated wetland or upland conditions. The methods and criteria used to determine the presence of wetland vegetation, hydric soil, and wetland hydrology data are described below.

All observation points were recorded with a survey grade Global Positioning System (GPS). A Trimble GeoXT GPS unit with 1 meter horizontal accuracy was used to record the coordinates and elevation of each sample location. After returning from the field, all recorded sample locations were downloaded to GIS and field data entered into an Excel spreadsheet.

#### **2.2.1 Wetland Characteristics**

To be considered a wetland, under normal circumstances, an area must have (1) hydrophytic (wetland) vegetation, (2) hydric soils, and (3) wetland hydrology (WSDOE, 1997; Environmental Laboratory, 1987). Areas that do not support indicators for one or more of these three characteristics are generally not considered wetlands.

##### **Vegetation**

Plant communities were evaluated to determine whether hydrophytic vegetation was present by observing the respective plant cover of individual plant species at each location to determine dominant plant species. A hydrophytic vegetation community exists when more than 50 percent of the dominant plants have an indicator status of Facultative, Facultative Wetland, or Obligate Wetland, based on the wetland indicator status assigned to each plant species by USFWS (Reed, 1997). Table 2 lists the definitions of these wetland indicator status categories. The scientific and common plant names used are consistent with the PLANTS Database (USDA, NRCS 2004). Plant species were recorded on data sheets for each data plot (Appendix A).

Smith Island Wetland Characterization Report  
May 2008

**Table 1. Key to Plant Indicator Status**

Category	Symbol	Definition
Obligate Wetland Plants	OBL	Plants that almost always (>99% of the time) occur in wetlands, but which may rarely (<1% of the time) occur in non-wetlands
Facultative Wetland Plants	FACW	Plants that often (67 to 99% of the time) occur in wetlands, but sometimes (1 to 33% of the time) occur in non-wetlands
Facultative Plants	FAC	Plants with a similar likelihood (33 to 67% of the time) of occurring in both wetlands and non-wetlands
Facultative Upland Plants	FACU	Plants that sometimes (1 to 33% of the time) occur in wetlands, but occur more often (67 to 99% of the time) in non-wetlands
Upland Plants	UPL	Plants that rarely (<1% of the time) occur in wetlands, and almost always (>99% of the time) occur in non-wetlands

Source: Reed (1997)

### **Soil**

Soils were observed in the field by digging sample pits to a depth of at least 18 inches to examine the soil profiles. Soil descriptions were recorded for soil profiles at each sample location to determine whether hydric soil indicators are present. Hydric soil forms when the soil is saturated or inundated long enough during the growing season for anaerobic processes to occur. These processes alter soil profile composition and exhibit specific indicators of hydric conditions. A common hydric soil indicator is low chroma matrix colors with bright colored mottles. Other indicators include the presence of a sulfidic odor, high organic content, and staining by organic matter in the subsurface.

### **Hydrology**

The study area was examined for evidence of wetland hydrology. The depth to ground water was recorded at each station and indicators of surface hydrology were noted at each sample location. An area has wetland hydrology when soils are inundated or saturated for at least 12.5 percent of the growing season. Areas inundated or saturated between 5 percent and 12.5 percent of the growing season may or may not be wetlands. Common indicators of wetland hydrology include surface inundation and saturated soils. Other indicators include water marks, drift lines, sediment deposits, drainage patterns, oxidized root channels, and water stained leaves.

#### **2.2.2 Wetland Boundary Determination**

In order to establish an approximate wetland boundary, Public Works staff analyzed the data and selected an elevation that best represented the boundary between upland and wetland. Data from each observation point was entered into an Excel spreadsheet and GPS locations were downloaded into Arc Info. An elevation for each location was obtained using LIDAR imagery. An distance above the elevation where wetland characteristics were consistently present was used as the wetland boundary to account for natural variation in wetland topography and ensure all wetland areas were captured.

Smith Island Wetland Characterization Report  
May 2008

Based on the relatively flat topography of the study area, a wetland boundary elevation for the study area can be extrapolated to the entire project area.

### **2.2.3 Wetland Rating**

After determining the wetland area, Public Works staff rated the wetland(s) using *Washington State Wetland Rating System for Western Washington* (Hruby 2004).

## **3.0 RESULTS**

Field investigations were undertaken by a Public Works Ecologist in May, 2007. The following sections describe existing site conditions, and wetland characterization within the study area as found during the field investigations.

### **3.1 GENERAL SITE CHARACTERISTICS**

#### **3.1.1 Vegetation**

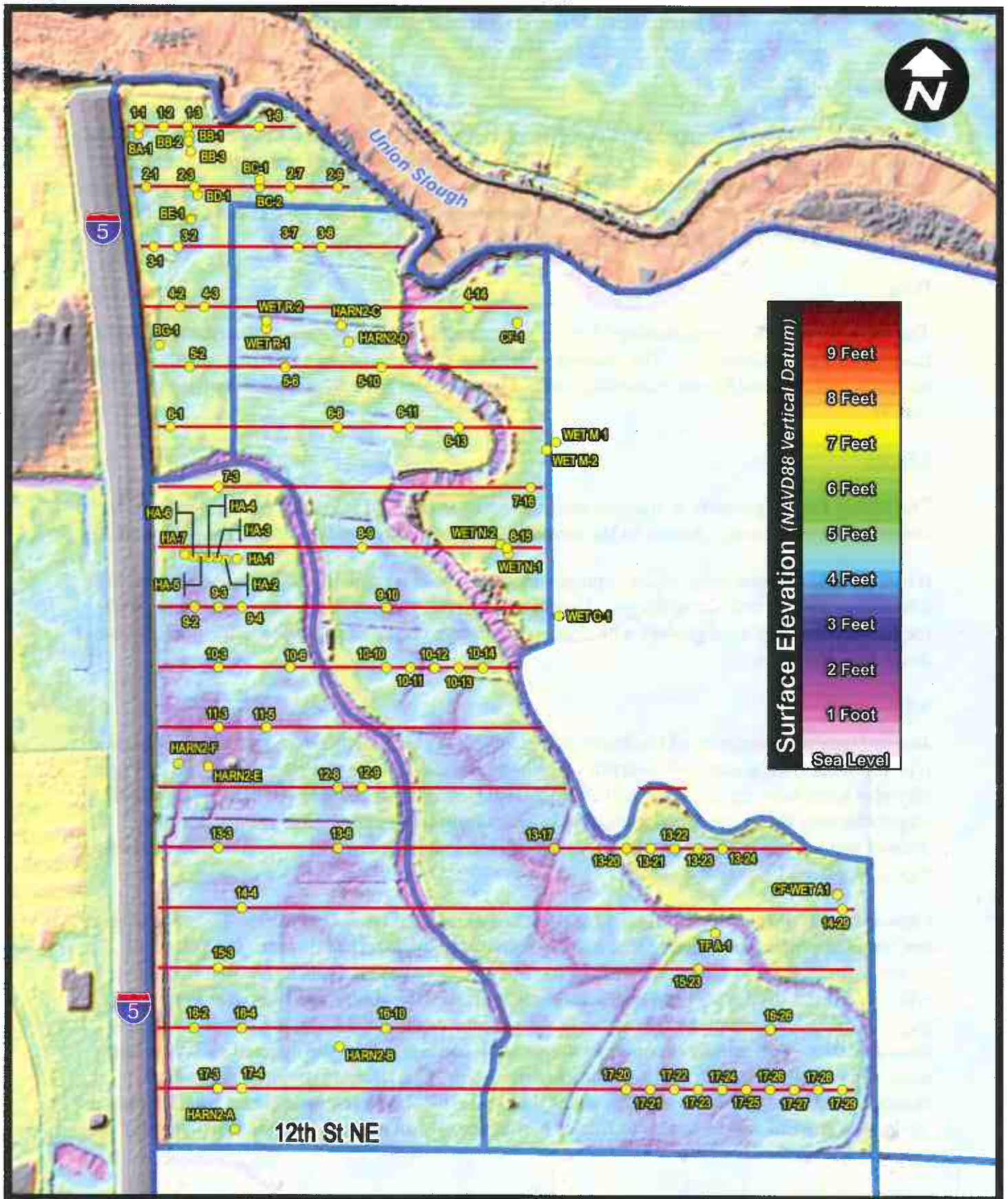
Historically, the project area was primarily used for agriculture since it was diked in the late 1800s. Prior to diking and clearing, the site was predominately covered in scrub-shrub vegetation, with sparse tree coverage growing along natural levees (Haas and Collins, 2001). Based on analysis of the Government Land Office (GLO) survey notes from the late 1800s, an area of land stretching across the Snohomish estuary (including the project area) was identified as being in the Emergent-Forested Transition (EFT) zone (Haas and Collins, 2001).

The project area occupies approximately 400 acres and can generally be characterized as fallow agricultural land, grazed pasture and tree farm nursery. The vegetation at the project site has been substantially altered from pre-settlement conditions. The majority of the area was converted to agricultural use, but now lays fallow and is dominated by non-native species such as Blackberry, and reed canarygrass. The background images in Figure 1 and 3 are 2007 aerial photos and provide a reference to the overall vegetation patterns of the project site. For the purposes of this report, plant communities are described for each ownership parcel on Smith Island below.

#### **Snohomish County – Conservation Futures Property**

Approximately 100 acres of the site was purchased by Snohomish County with Conservation Future funds. This area is in the center of the project site (Figure 1). A majority of this area was rented by the Harnden Tree Nursery and the vegetation consists of rows of non-native ornamental tree species. The ground cover is dominated by orchard grass (*Dactylis glomerata*), velvet grass (*Holcus lanatus*) and creeping buttercup (*Ranunculus repens*). These species have indicator statuses of FACU, FAC, and FACW respectively.





**Figure 2. Smith Island Wetland Characterization Study Area**

Smith Island Wetland Characterization Report  
May 2008

Harnden

The Harnden property is approximately 50 acres in size and is located on the western side of the project site bordering I-5 (Figure 1). The existing vegetation is rows of non-native ornamental tree species. The ground cover is dominated by orchard grass (*Dactylis glomerata*), velvet grass (*Holcus lanatus*) and creeping buttercup (*Ranunculus repens*). These species have indicator statuses of FACU, FAC, and FACW respectively.

Buse

The Buse property is approximately 15 acres in size and is located on the northwestern corner of the project site bordering I-5. The existing vegetation is dominated by soft rush (*Juncus effusus*) and reed canarygrass (*Phalaris arundinacea*). These species have an indicator statuses of FACW.

Rhodes

The Rhode Family property is approximately 80 acres in size and is located on the Southwestern corner of the study area. Access to the property was not allowed at the time of the field work.

Based on observations from adjacent properties, this parcel is primarily active horse pasture with a residence and several out buildings. There is a small forested area around the residence, while the pasture area is grazed grasses with areas of Himalayan blackberry (*Rubus armeniacus*) around fence and ditch lines.

**3.1.2 Soils**

The soil type for a majority of the study area is Puget silty clay loam, which has a low infiltration rate and a seasonal ground water depth of 24 to 48 inches (Debose and Klungland, 1983). Puget silty clay loam soils are included on the Snohomish County hydric soil list (USDA, NRCS 2001). Puget silty clay loams are found in depressional areas on flood plains, have been artificially drained and formed in alluvium. Permeability of Puget soils is slow and available water capacity is high (Debose and Klungland, 1983).

Observation of onsite soils confirmed the presence of mapped types (Figure 3). The soils within the Harnden property and active tree nursery were typically disturbed down to a depth of 12 inches from equipment movement around the site or tree removal. Soils below that depth typically did not display wetland characteristics (mottles were absent and soils didn't appear gleyed). However, samples taken in lower depressions or drainage ways, did display wetland characteristics. Soil samples in other locations were consistent with the mapped soil types, and more consistently demonstrated wetland characteristics. One or more of the remnant tidal channels may be regulated as streams under the local critical area regulations and whether they are wetland or streams will be assessed further as part of the critical area study to be completed for the proposed project.

Smith Island Wetland Characterization Report  
May 2008

### 3.1.3 Hydrology

The surface water hydrology appears to be primarily driven by precipitation as a perimeter dike isolates the site from tidal hydrology (Figure 3). Groundwater hydrology is likely influenced by infiltration of precipitation and adjacent sloughs. A network of ditches, two remnant tidal channels and three tide gates along the perimeter dike provide site drainage (Figure 4). Most of the study area drains to the remnant tidal channels that outlet through tide gates into Union Slough. Some of the western part of the site drains through three culverts under I-5 and ultimately discharges through tide gates into the Snohomish River mainstem channel.

Maps and aerial photos of the project site were obtained from National Resource Conservation Service (NRCS) that show drainage features. As-built maps from 1987 of the Harnden property show drain tile locations and depths. Drain tile appear to be set on 75 to 80 foot intervals, at a minimum depth of 24 inches (Figure 3 and Appendix A). NRCS did not have files indicating that any drain tile had been installed on the remaining properties, but aerial photos showed numerous ditches throughout the site. During site visits, field observations confirmed the presence of drainage features. The drain tile locations for the Harnden property were confirmed and a ditch network on the Conservation Futures property was observed.

In those areas that do not have significant drainage features such as the Buse Timber property, both surface and ground water likely contribute to wetland hydrology. However, the degree to which surface and ground water influenced each other appears to be limited by the impermeability of the soil. For example, areas of the Buse Timber parcel had ponded water on the surface, yet adjacent soil test pits did not have a high ground water table.

### 3.2 WETLAND BOUNDARY DETERMINATION

The project area is isolated inside a perimeter dike, and is relatively flat; elevations in the study area range from 2 to 8 feet<sup>1</sup> inside the dike with a majority of the site between 4 and 6 feet<sup>1</sup> (Figure 2). One hundred and one field points were located and surveyed with a Trimble GeoXT GPS unit. This data was analyzed and compared to observed wetland characteristics.

Reviewing maps of the drain tile and drainage ditches and correlating those with the field data, it was evident that areas with maintained drain tile or ditch networks were altering the hydrology. Data from these areas were removed from the analysis and the remaining data was analyzed to determine an elevation where wetland characteristic were present (Table 3).

- Ninety percent (35 of 39) of data points below 5 feet<sup>1</sup> demonstrated all three wetland characteristics (hydrology, soil and vegetation).
- No data points above 6 feet<sup>1</sup> demonstrated all three wetland characteristics.
- Fifty percent (6 of 12) of the data points between 5 and 6 feet<sup>1</sup> demonstrated wetland characteristics.

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<sup>1</sup> North American Vertical Datum of 1988 (NAVD88)

Smith Island Wetland Characterization Report  
May 2008

Based on these results, we determined that areas below an elevation of 5 feet<sup>1</sup> consistently demonstrated wetland characteristics and selected an elevation of 6 feet<sup>1</sup> to represent the boundary between wetland and upland (Figure 5) for the entire project area. All but one small area of the tree nursery are excluded as the drain tile and ditch network appear to have effectively drained these areas. However, a more in-depth analysis of groundwater hydrology in these areas may find wetland hydrology is present in some areas.

Additional support for using an elevation of 6 feet<sup>1</sup> to represent a wetland boundary was obtained from a wetland delineation conducted by Washington Department of Transportation (WSDOT) on the Buse property in September of 2007. County staff overlaid LIDAR imagery on the wetland map and reviewed the location of the wetland boundary in relation of the elevation (Figure 5). Although the delineated wetland does not exactly match the 6 foot elevation line, there are only very small areas of delineated wetland that are outside of 6 foot elevation line, while over 95% of the wetland is within the 6 foot elevation line. This correlation clearly supports the level of precision that could be anticipated from our method of selecting an elevation slightly above where wetlands characteristics are consistently found.

### 3.3 WETLAND RATING

Extrapolating the 6 foot<sup>1</sup> wetland elevation to the entire Smith Island project site, the wetland was rated according to *Washington State Wetland Rating System for Western Washington* (Hruby 2004). Based on the scores for water quality, hydrology and habitat, the wetland was rated as a Category II wetland (Table 2). Complete wetland rating forms are in Appendix B.

The wetland was rated as one large depressional wetland as the areas above 6 feet<sup>1</sup> are limited to small upland mounds and the perimeter dike (Figure 5). The wetland has the potential to provide moderate water quality functions because it does not have a surface water outlet. Over 50% of the wetland has persistent ungrazed vegetation, and greater than a 25% of the wetland is seasonally ponded. Further the wetland has the opportunity to improve water quality functions because adjacent land uses contribute pollutants to the wetland that would otherwise reduce water quality in Union Slough.

The wetland provides moderate hydrologic functions because the surface water outlet is regulated by a tide gate (if the remnant tidal channels are considered wetlands) or there is no surface water outlet (if remnant tidal channels are considered streams) and there are areas the pond water is at least 6 inches deep. However, based on its position in the landscape, the wetland does not have the potential to reduce flooding.

The wetland provides both high level of habitat potential and opportunity. The wetland has the potential to provide habitat based on having a multiple, interspersed vegetation types, having multiple hydroperiods, and several unique habitat features (snags, downed woody debris, and aquatic thin-stemmed vegetation). The wetland has the opportunity to provide habitat due to its position within the landscape. As previously discussed, the wetland is centrally located within the

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<sup>1</sup> North American Vertical Datum of 1988 (NAVD88)



Smith Island Wetland Characterization Report  
May 2008

Snohomish Estuary, is adjacent to Union Slough, and provides habitat connectivity with Ebbey Island, and Spencer Island.

**Table 2. Results of Wetland Rating System Functional Scoring**

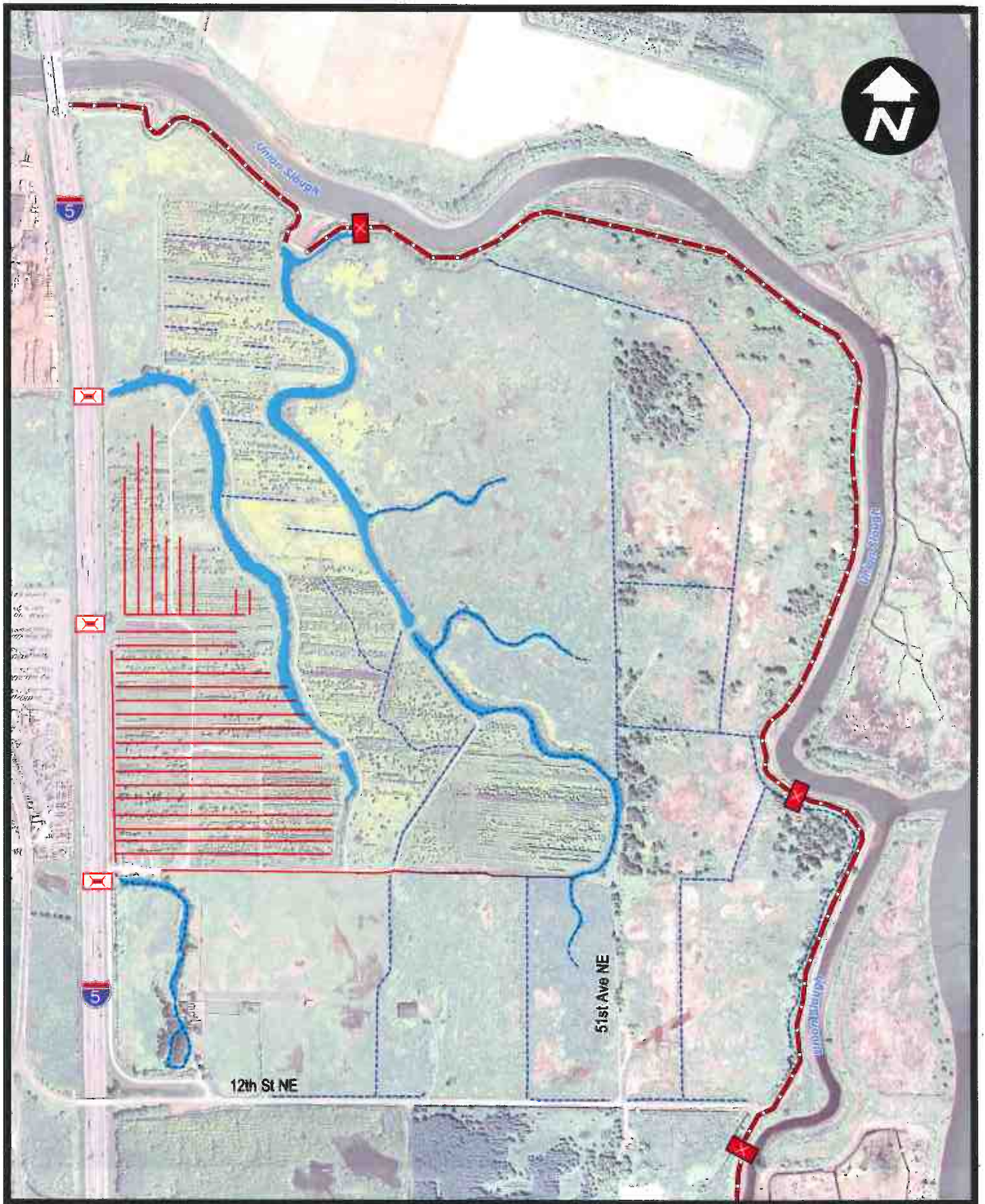
	Improving Water Quality		Hydrologic Functions		Habitat Functions		Score	Rating
	Potential	Opportunity	Potential	Opportunity	Potential	Opportunity		
Smith Island	Moderate (8)	Yes (16)	Moderate (6)	No (6)	High (16)	High (16)	54	II

Smith Island Wetland Characterization Report  
May 2008

**Table 3. Smith Island Wetland Characterization Data**

Property	Station	Soil texture	Dominant Vegetation	Ground Elevation (NAVD88)	Depth to Groundwater (inches)
Tree Farm	17-20	Sandy Clay Loam	Water Foxtail	3.1	0
Tree Farm	17-27	Sandy Clay Loam	creeping buttercup / orchardgrass	3.1	0
Tree Farm	17-25	Sandy Clay Loam	creeping butter cup / orchardgrass	3.3	0
Tree Farm	17-21	Sandy Clay Loam	Water Foxtail	3.4	0
Tree Farm	17-24	Sandy Clay Loam	Water Foxtail / Soft Rush	3.5	0
Con Future	CE-WET A1	Silty Clay Loam	RCG / creeping buttercup / Soft Rush	3.5	0
Buse	3-2	Silty Clay Loam	RCG	3.5	0
Tree Farm	17-26	Sandy Clay Loam	creeping buttercup / orchard grass	3.5	3
Con Future	CF-1	Silty Clay Loam	Soft Rush / creeping buttercup	3.5	14
Tree Farm	17-22	Sandy Clay Loam	Water Foxtail	3.5	3
Buse	BB-2	Silty Clay Loam	RCG	3.6	4
Con Future	13-21	Silty Clay Loam	RCG	3.6	6
Buse	BG-1	Silty Clay Loam	RCG	3.6	8
Con Future	13-22	Silty Clay Loam	Soft Rush	3.7	2
Tree Farm	17-28	Sandy Clay Loam	creeping buttercup / orchardgrass	3.8	2
Buse	BD-1	Silty Clay Loam	RCG / Cattail	3.8	3
Con Future	WET N-1	Silty Clay Loam	orchard grass / Soft Rush	3.8	16
Con Future	WET M-1	Silty Clay Loam	RCG / Soft Rush	3.9	12
Con Future	WET O-1	Silty Clay Loam	Silverweed	3.9	3
Tree Farm	4-5	Silty Clay Loam	orchard grass	3.9	6
Tree Farm	TF A-1	Sandy Clay Loam	Water Foxtail / Soft Rush	3.9	7
Con Future	14-29	Silty Clay Loam	Velvet Grass, RCG	4.0	8
Buse	BC-2	Silty Clay Loam	RCG / creeping buttercup	4.1	8
Tree Farm	17-23	Sandy Clay Loam	creeping buttercup	4.1	7
Tree Farm	16-26	Sandy Clay Loam	orchard Grass / creeping buttercup	4.1	11
Buse	3-1	Silty Clay Loam	RCG	4.1	9
Tree Farm	15-23	Sandy Clay Loam	orchard Grass / creeping buttercup	4.2	11
Con Future	13-24	Silty Clay Loam	Soft Rush	4.3	2
Con Future	8-15	Silty Clay Loam	creeping buttercup	4.3	17
Buse	2-1	Silty Clay Loam	RCG	4.4	10
Con Future	7-16	Silty Clay Loam	Silver Weed / Soft Rush	4.5	10
Buse	BB-1	Silty Clay Loam	RCG	4.5	6
Buse	6-1	Silty Clay Loam	RCG	4.6	> 18
Buse	BA-1	Silty Clay Loam	RCG	4.6	6
Con Future	13-23	Silty Clay Loam	RCG	4.8	13
Buse	2-3	Silty Clay Loam	RCG	4.9	14
Buse	2-9	Silty Clay Loam	Velvet Grass	4.9	18
Con Future	WET N-2	Silty Clay Loam	creeping buttercup	4.9	22
Buse	5-2	Silty Clay Loam	RCG	4.9	> 24
Con Future	WET M-2	Silty Clay Loam	RCG	5.0	22
Tree Farm	17-29	Sandy Clay Loam	creeping buttercup / orchard grass	5.0	14
Buse	BC-1	Silty Clay Loam	Soft Rush	5.2	14
Buse	4-3	Silty Clay Loam	RCG	5.3	> 24
Buse	BE-1	Silty Clay Loam	RCG / creeping buttercup	5.3	14
Buse	1-6	Silty Clay Loam	Orchard Grass / Dandelion	5.3	> 18
Buse	1-2	Silty Clay Loam	RCG / creeping buttercup	5.4	18
Buse	BB-3	Silty Clay Loam	RCG / creeping buttercup	5.4	14
Buse	1-3	Silty Clay Loam	RCG	5.4	16
Con Future	4-14	Silty Clay Loam	creeping buttercup	5.9	> 18
Buse	1-1	Silty Clay Loam	RCG, creeping buttercup	6.0	14
Buse	2-7	Silty Clay Loam	Velvet Grass	6.0	> 24
Con Future	13-20	Silty Clay Loam	Blackberry / RCG / creeping buttercup	6.6	> 18





**Key to Features:**

-- Ditches On Site

— 1987 Harndin Drain Tiles

⊠ Tide Gate

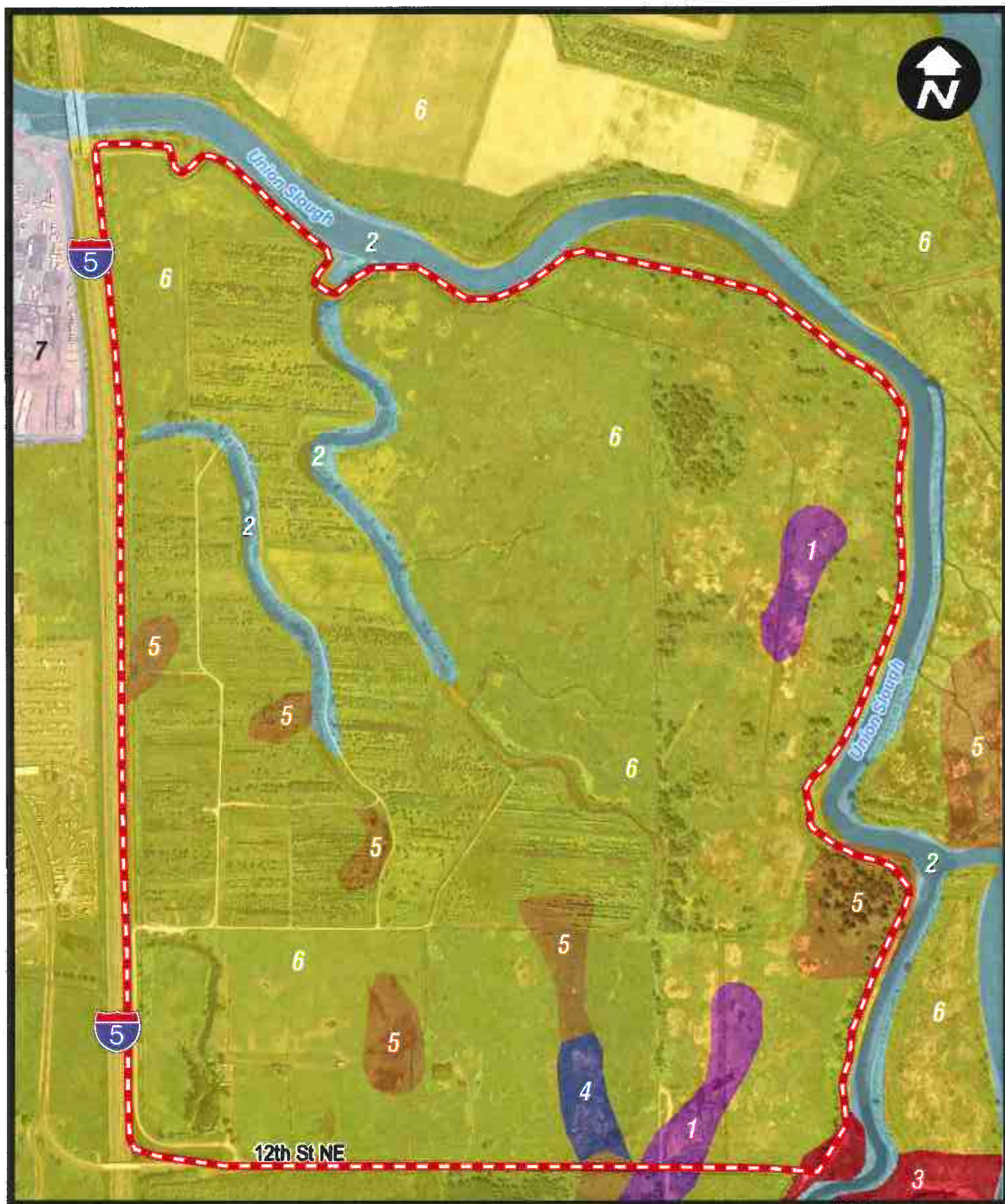
■ Remanent Tidal Channels

- - - Dike

⊞ Culvert

**Figure 3. Smith Island Drainage Network**





**Key to Features:**



Smith Island Project Area



Mukilteo Muck



Water



Xerorthents, Nearly Level



Teric Medisaprists, Nearly Level



Snohomish Silt Loam



Puget Silty Clay Loam

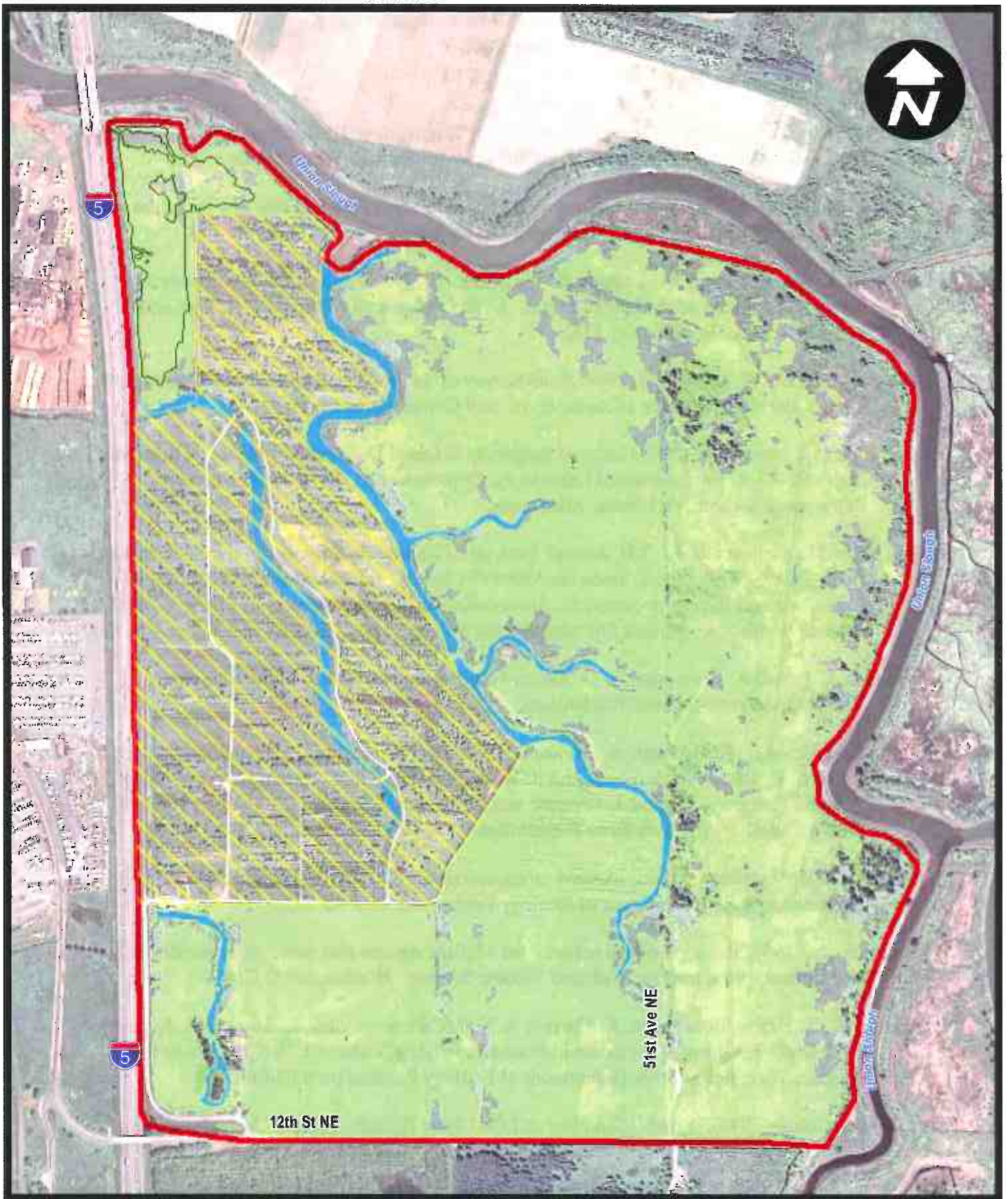


Urban Land

**Source:** Natural Resources Conservation Service, United States Department of Agriculture (USDA), December 1999.

**Figure 4. Smith Island Soils**





**Key to Features:**



Smith Island Project Area



Wetland Area ( $\leq 6'$  NAVD88 Elevation)

Areas of Altered Hydrology



WSDOT Wetland Delineation

Remanent Tidal Channels

**Figure 5. Smith Island Wetlands**

Smith Island Wetland Characterization Report  
May 2008

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Smith Island Wetland Characterization Report  
May 2008

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Smith Island Wetland Characterization Report  
May 2008

**APPENDIX A. Harnden As-Built**



UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

ADDRESS: 630 Vernon Rd #1  
Everett WA 98205  
PHONE: 334-2828

Construction and Material Specifications  
for

Project: Subsurface Drainage Practice Code: 606  
Location: Sec. 9, T. 29, R. 5, Project Class: II  
Owner: Dick Harndin  
Address: 16426 67th W.  
Lynwood WA 98037

**AS BUILT**

DATE OF COMPLETION

11/19/87

Bill Trilftan  
Additions on Red

Location of Utilities

No representation is made as to the existence or non-existence of any utilities, public or private. Absence of utilities on these drawings is not assurance that no utilities are present. If buried utilities are shown the location and depth are approximate. The exact location and depth of any utility must be determined by the utility company prior to any excavation.

Received by: #

Prepared by: Bill Trilftan SGT

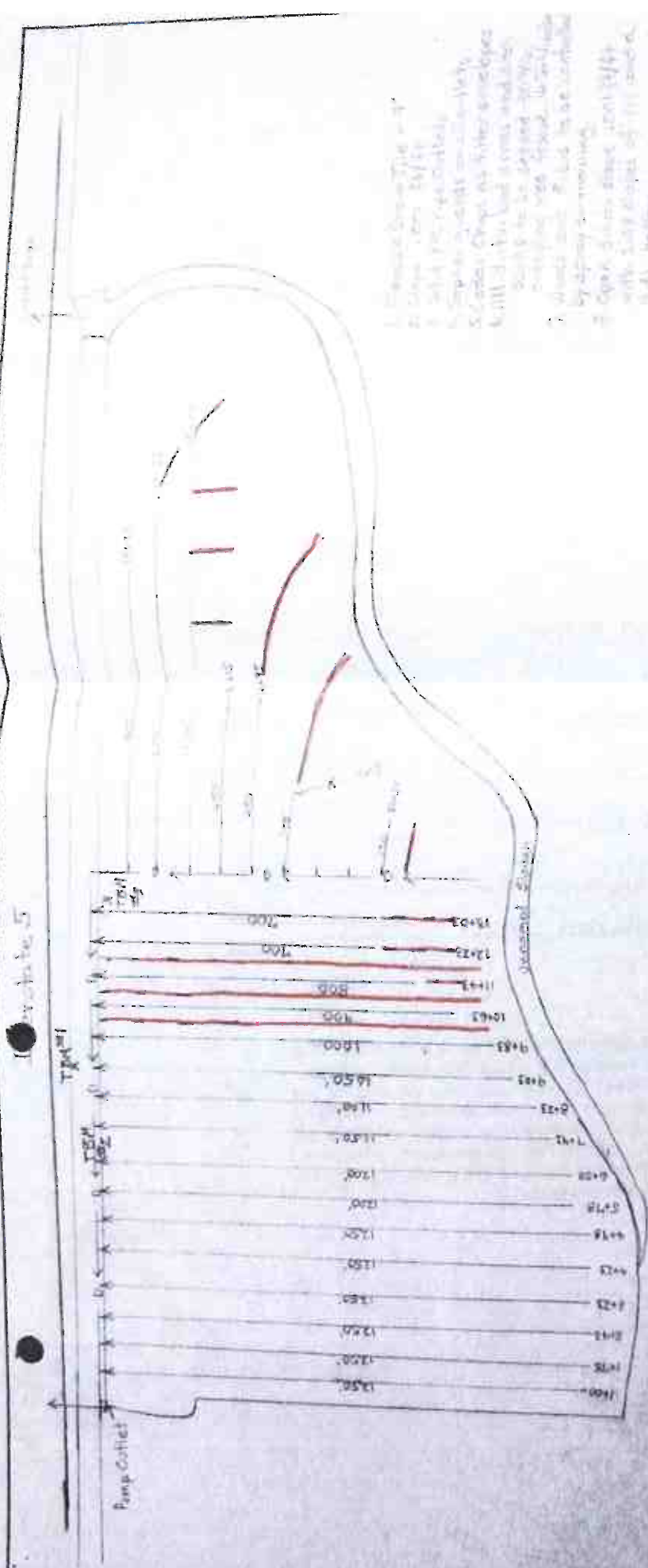
Date: \_\_\_\_\_

(Misc-A)



November 1985

Sheet 5



1. Channel bottom profile - 1/4"
2. 1/4" scale, 1/4" high
3. 1/4" scale, 1/4" high
4. 1/4" scale, 1/4" high
5. 1/4" scale, 1/4" high
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99. 1/4" scale, 1/4" high
100. 1/4" scale, 1/4" high



U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

Ditch Hardin  
Subsurface Inevig  
Location Map

Scale 1:250

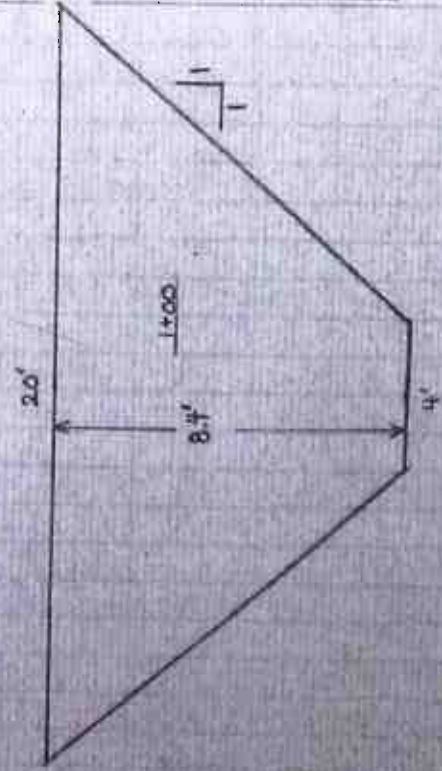
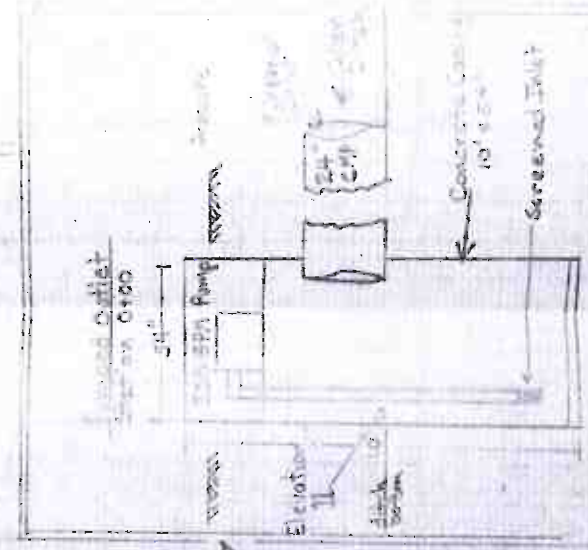
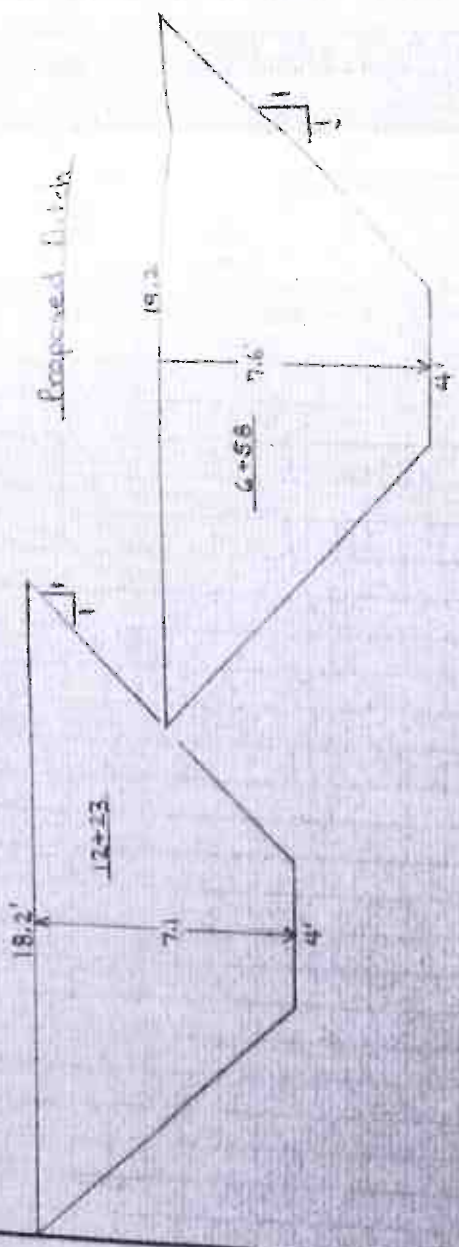
Project No. 11-10-100  
Sheet No. 11-10-100  
Job No. 11-10-100  
Date 11-10-100



Existing Ditch



Proposed Ditch



U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

Project No.	Sheet No.	Scale	Date
Drawn by	Checked by	Approved by	Field No.
Field No.	Sheet No.	Scale	Date
Drawn by	Checked by	Approved by	Field No.

Open Ditch

Existing Ditch Bottom  
Proposed Ditch Bottom

1835 Tile

20x22 Tile

13x25 Tile

13x25 Tile

20x22 Tile

5x7.5

13x25

5x7.5

Dick Hardin  
Profiles  
Subsurface Drainage

U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

Project No.	8-21
County	Bartholomew
Section	36E
Range	14E
Township	36N
State	IN
Date	1-17-70

1-17-70



STATE

WA

COUNTY

Bill Railton

DATE 8-5-87

PROJECT

Dick Harndin - Subsurface Drainage

CHECKED BY

DATE

SHEET 4

## Computations

A-1  
Drainage  
Guide

Crop - Nursery Stock  
Soil - Puget S.C.L.  
Class - A  
Dr Coeff .65  
Filter - Cedar Chips as envelope  
Spacing - 80'  
Depth - min. 2'

ADS  
Calculator

15+35

$$\frac{(.65)(80)(1100+40)}{(24)(43,200)} = \frac{59280}{1036800} = .057 \text{ cfs} = \underline{25 \text{ gpm}}$$

at .0005 slope < 700' - 4"  
500' - 5"

7+43

$$\frac{(.65)(80)(1150+40)}{1036800} = .0597 = \underline{27 \text{ gpm}}$$

at .0005 slope < 700' - 4"  
450' - 5"

At S = .001 4" tile for ≤ 1000'

At S = .0005 4" tile for ≤ 700'

Total Q (for pump size needs)

20,550 foot tile

$$\frac{(.65)(80)(20550+40)}{24(43,200)} = \frac{1070680}{1036800} = 1.033 \text{ cfs}$$

or  
462 gpm

Decision of 350 gpm pump  
to be installed:

- 1) Pump failure is usually caused by cycling, however volume pump will cycle less.
- 2) If one 350 gpm pump is not sufficient, another pump will be added.

Giuseppe J. Struelens  
8/11/87 M. B. B.

Smith Island Wetland Characterization Report  
May 2008

**APPENDIX B. Wetland Rating Forms**

Wetland name or number \_\_\_\_\_

Preliminary - Assumed entire site was wetland  
and removed areas of known upland  
(above 6' NAVD 88), then rated as a  
wetland mosaic.

**WETLAND RATING FORM - WESTERN WASHINGTON**

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Smith Is, Buse, Hordis & County Prop. Date of site visit: 5/3/07

Rated by M. Stamey Trained by Ecology? Yes ☒ No ☐ Date of training 5/2006

SEC: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ RANGE: \_\_\_\_\_ Is S/T/R in Appendix D? Yes ☐ No ☐

Map of wetland unit: Figure \_\_\_\_\_ Estimated size \_\_\_\_\_

**SUMMARY OF RATING**

Category based on FUNCTIONS provided by wetland

I \_\_\_\_\_ II ☒ III \_\_\_\_\_ IV \_\_\_\_\_

Category I = Score  $\geq 70$   
Category II = Score 51-69  
Category III = Score 30-50  
Category IV = Score  $< 30$

Score for Water Quality Functions

24

Score for Hydrologic Functions

6

Score for Habitat Functions

29

**TOTAL score for Functions**

59

Category based on SPECIAL CHARACTERISTICS of wetland

I \_\_\_\_\_ II \_\_\_\_\_ Does not Apply \_\_\_\_\_

**Final Category** (choose the "highest" category from above)

II

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics	Wetland HGM Class used for Rating	
Estuarine	Depressional	
Natural Heritage Wetland	Riverine	
Bog	Lake-fringe	
Mature Forest	Slope	
Old Growth Forest	Flats	
Coastal Lagoon	Freshwater Tidal	
Interdunal		
None of the above	Check if unit has multiple HGM classes present	<input type="checkbox"/>

Wetland name or number \_\_\_\_\_

**Does the wetland unit being rated meet any of the criteria below?**

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

<b>Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)</b>	<b>YES</b>	<b>NO</b>
SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered <b>animal or plant</b> species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered <b>animal</b> species?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i>		X
SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.



## Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?

☒ NO - go to 2

☐ YES - the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES - Freshwater Tidal Fringe** **NO - Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. ).*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it.

Groundwater and surface water runoff are NOT sources of water to the unit.

☒ NO - go to 3

☐ YES - The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

☐ At least 30% of the open water area is deeper than 6.6 ft (2 m)?

☒ NO - go to 4

☐ YES - The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?

☐ The wetland is on a slope (*slope can be very gradual*),

☐ The water flows through the wetland in one direction (**unidirectional**) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

☐ The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*

☒ NO - go to 5

☐ YES - The wetland class is **Slope**

Wetland name or number \_\_\_\_\_

5. Does the entire wetland unit **meet all** of the following criteria?

\_\_\_\_\_ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

\_\_\_\_\_ The overbank flooding occurs at least once every two years.

*NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.*

☒ **NO** - go to 6     ☐ **YES** - The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ **NO** - go to 7     ☒ **YES** - The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ **NO** - go to 8     ☒ **YES** - The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. **GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT** (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. **NOTE:** Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

<i>HGM Classes within the wetland unit being rated</i>	<i>HGM Class to Use in Rating</i>
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number \_\_\_\_\_

<b>D Depressional and Flats Wetlands</b>		<b>Points</b> (only 1 score per box)
<b>WATER QUALITY FUNCTIONS</b> - Indicators that the wetland unit functions to improve water quality		
<b>D</b>	<b>D 1. Does the wetland unit have the <u>potential</u> to improve water quality?</b>	(see p.38)
<b>D</b>	<p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p>Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch points = 1</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p>Provide photo or drawing</p>	Figure ____ 3
<b>D</b>	<p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p>YES points = 4</p> <p>NO points = 0</p>	4
<b>D</b>	<p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p>Wetland has persistent, ungrazed, vegetation &gt;= 95% of area points = 5</p> <p>Wetland has persistent, ungrazed, vegetation &gt;= 1/2 of area points = 3</p> <p>Wetland has persistent, ungrazed vegetation &gt;= 1/10 of area points = 1</p> <p>Wetland has persistent, ungrazed vegetation &lt;1/10 of area points = 0</p> <p>Map of Cowardin vegetation classes</p>	Figure ____ 3
<b>D</b>	<p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.</i></p> <p>Area seasonally ponded is &gt; 1/2 total area of wetland points = 4</p> <p>Area seasonally ponded is &gt; 1/4 total area of wetland points = 2</p> <p>Area seasonally ponded is &lt; 1/4 total area of wetland points = 0</p> <p>Map of Hydroperiods</p>	Figure ____ 2
<b>D</b>	<b>Total for D 1</b> Add the points in the boxes above	12
<b>D</b>	<p><b>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</b></p> <p>Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.</p> <p>— Grazing in the wetland or within 150 ft</p> <p>— Untreated stormwater discharges to wetland</p> <p><input checked="" type="checkbox"/> Tilled fields or orchards within 150 ft of wetland</p> <p><input checked="" type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</p> <p>— Residential, urban areas, golf courses are within 150 ft of wetland</p> <p>— Wetland is fed by groundwater high in phosphorus or nitrogen</p> <p>— Other _____</p> <p><b>YES multiplier is 2 NO multiplier is 1</b></p>	(see p. 44)  multiplier 2
<b>D</b>	<p><b>TOTAL - Water Quality Functions</b> Multiply the score from D1 by D2</p> <p>Add score to table on p. 1</p>	24

Wetland name or number \_\_\_\_\_

D Depressional and Flats Wetlands		Points (only 1 score per box)
HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation		
	<b>D 3. Does the wetland unit have the potential to reduce flooding and erosion?</b>	(see p.46)
D	<p>D 3.1 Characteristics of surface water flows out of the wetland unit</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch points = 1</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (permanently flowing) points = 0</p>	3
D	<p>D 3.2 Depth of storage during wet periods</p> <p>Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).</p> <p>Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</p> <p>The wetland is a "headwater" wetland points = 5</p> <p>Marks of ponding between 2 ft to &lt; 3 ft from surface or bottom of outlet points = 5</p> <p>Marks are at least 0.5 ft to &lt; 2 ft from surface or bottom of outlet points = 3</p> <p>Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1</p> <p>Marks of ponding less than 0.5 ft points = 0</p>	3
D	<p>D 3.3 Contribution of wetland unit to storage in the watershed</p> <p>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</p> <p>The area of the basin is less than 10 times the area of unit points = 5</p> <p>The area of the basin is 10 to 100 times the area of the unit points = 3</p> <p>The area of the basin is more than 100 times the area of the unit points = 0</p> <p>Entire unit is in the FLATS class points = 5</p>	0
D	<b>Total for D 3</b>	6
D	<p><b>D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?</b></p> <p>Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur.</p> <p>Note which of the following indicators of opportunity apply.</p> <ul style="list-style-type: none"> <li>— Wetland is in a headwater of a river or stream that has flooding problems</li> <li>— Wetland drains to a river or stream that has flooding problems ?</li> <li>— Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems</li> <li>— Other _____</li> </ul> <p><b>YES multiplier is 2      NO multiplier is 1</b></p>	(see p. 49)
D	<b>TOTAL - Hydrologic Functions</b> Multiply the score from D 3 by D 4	multiplier
	Add score to table on p. 1	1
		6

wetland  
drains to  
a heavily  
diked  
estuary.





Wetland name or number \_\_\_\_\_

**H 1.4. Interspersion of habitats (see p. 76)**

Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



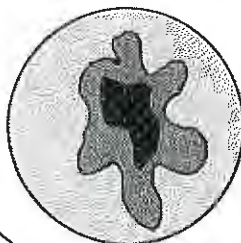
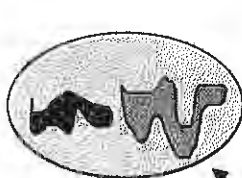
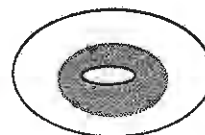
None = 0 points



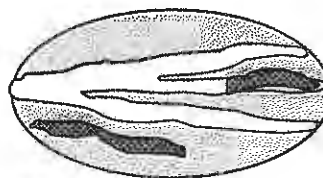
Low = 1 point



Moderate = 2 points



High = 3 points



[riparian braided channels]

NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes

Figure \_\_\_\_\_

2

**H 1.5. Special Habitat Features: (see p. 77)**

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

☒ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

☒ Standing snags (diameter at the bottom > 4 inches) in the wetland

☐ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

☒ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)

☒ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.(structures for egg-laying by amphibians)

☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

4

**H 1. TOTAL Score - potential for providing habitat**  
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

13

Comments

<p><b>H 2. Does the wetland unit have the opportunity to provide habitat for many species?</b></p> <p><b>H 2.1 Buffers</b> (see p. 80)  Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."</p> <ul style="list-style-type: none"> <li>— 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) <b>Points = 5</b></li> <li><del>X</del> 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt; 50% circumference. <b>Points = 4</b></li> <li><del>X</del> 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;95% circumference. <b>Points = 4</b></li> <li>— 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt; 25% circumference. <b>Points = 3</b></li> <li>— 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for &gt; 50% circumference. <b>Points = 3</b></li> </ul> <p style="text-align: center;"><b>If buffer does not meet any of the criteria above</b></p> <ul style="list-style-type: none"> <li>— No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland &gt; 95% circumference. Light to moderate grazing, or lawns are OK. <b>Points = 2</b></li> <li>— No paved areas or buildings within 50m of wetland for &gt;50% circumference. Light to moderate grazing, or lawns are OK. <b>Points = 2</b></li> <li>— Heavy grazing in buffer. <b>Points = 1</b></li> <li>— Vegetated buffers are &lt;2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) <b>Points = 0.</b></li> <li>— Buffer does not meet any of the criteria above. <b>Points = 1</b></li> </ul> <p style="text-align: right;">Aerial photo showing buffers</p>	<p><b>Figure</b> _____</p> <p style="text-align: center; font-size: 2em;">4</p>
<p><b>H 2.2 Corridors and Connections</b> (see p. 81)</p> <p><b>H 2.2.1</b> Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).</p> <p style="text-align: center;">YES = <b>4 points</b> (go to H 2.3)                      NO = go to H 2.2.2</p> <p><b>H 2.2.2</b> Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? <b>OR</b> a <b>Lake-fringe</b> wetland, if it does not have an undisturbed corridor as in the question above?</p> <p style="text-align: center;">YES = <b>2 points</b> (go to H 2.3)                      NO = H 2.2.3</p> <p><b>H 2.2.3</b> Is the wetland:</p> <ul style="list-style-type: none"> <li>within 5 mi (8km) of a brackish or salt water estuary <b>OR</b></li> <li>within 3 mi of a large field or pasture (&gt;40 acres) <b>OR</b></li> <li>within 1 mi of a lake greater than 20 acres?</li> </ul> <p style="text-align: center;">YES = <b>1 point</b>                      NO = <b>0 points</b></p>	<p style="text-align: center; font-size: 2em;">4</p>

Total for page 8



**H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)**

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.*

*These are DFW definitions. Check with your local DFW biologist if there are any questions.*

- ☒ **Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres).
- ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- ☐ **Old-growth forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age.
- ☐ **Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.
- ☐ **Prairies:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.
- ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages
- ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.
- ☐ **Urban Natural Open Space:** A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.
- ☒ **Estuary/Estuary-like:** Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.
- ☐ **Marine/Estuarine Shorelines:** Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

If wetland has **3 or more** priority habitats = **4 points**

If wetland has **2** priority habitats = **3 points**

If wetland has **1** priority habitat = **1 point**

No habitats = **0 points**

*Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*

3

Wetland name or number \_\_\_\_\_

<p><b>H 2.4 Wetland Landscape</b> (choose the <i>one</i> description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. <span style="float: right;">points = 5</span></p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile <span style="float: right;">points = 5</span></p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed <span style="float: right;">points = 3</span></p> <p>The wetland is Lake-fringe on a lake <b>with</b> disturbance and there are 3 other lake-fringe wetland within ½ mile <span style="float: right;">points = 3</span></p> <p>There is at least 1 wetland within ½ mile. <span style="float: right;">points = 2</span></p> <p>There are no wetlands within ½ mile. <span style="float: right;">points = 0</span></p>	<div style="font-size: 2em;">5</div>
<p><b>H 2. TOTAL Score</b> - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	<div style="border: 1px dashed black; padding: 5px;">13</div>
<p>TOTAL for H 1 from page 14</p>	<div style="border: 1px dashed black; padding: 5px;">16</div>
<p><b>Total Score for Habitat Functions</b> – add the points for H 1, H 2 and record the result on p. 1</p>	<div style="border: 1px dashed black; padding: 5px;">29</div>

Wetland name or number \_\_\_\_\_

## **CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

*Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.*

<b>Wetland Type</b> <i>Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.</i>	<b>Category</b>
<b>SC 1.0 Estuarine wetlands (see p. 86)</b> Does the wetland unit meet the following criteria for Estuarine wetlands? <ul style="list-style-type: none"> <li>— The dominant water regime is tidal,</li> <li>— Vegetated, and</li> <li>— With a salinity greater than 0.5 ppt.</li> </ul> YES = Go to SC 1.1                      NO <u>X</u>	
<b>SC 1.1</b> Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I                      NO <u>go to SC 1.2</u>	<b>Cat. I</b>
<b>SC 1.2</b> Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II <ul style="list-style-type: none"> <li>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native <i>Spartina</i> spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of <i>Spartina</i> would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of <i>Spartina</i> in determining the size threshold of 1 acre.</li> <li>— At least ¼ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</li> <li>— The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.</li> </ul>	<b>Cat. I</b> <b>Cat. II</b>  <b>Dual rating</b> <b>I/II</b>



Wetland name or number \_\_\_\_\_

<p><b>SC 2.0 Natural Heritage Wetlands</b> (see p. 87)  Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.</p> <p>SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? <i>(this question is used to screen out most sites before you need to contact WNHP/DNR)</i>  S/T/R information from Appendix D ____ or accessed from WNHP/DNR web site ____</p> <p>YES ____ – contact WNHP/DNR (see p. 79) and go to SC 3.2      NO ____</p> <p>SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species?  YES = Category I      NO ____</p>	<p><b>Cat. I</b></p>
<p><b>SC 3.0 Bogs</b> (see p. 87)  Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.</i></p> <ol style="list-style-type: none"> <li>Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3      No - go to Q. 2</li> <li>Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond?  Yes - go to Q. 3      No - Is not a bog for purpose of rating</li> <li>Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the “bog” species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)?  Yes – Is a bog for purpose of rating      No - go to Q. 4</li> </ol> <p>NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog.</p> <ol style="list-style-type: none"> <li>Is the unit forested (&gt; 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann’s spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (&gt; 30% coverage of the total shrub/herbaceous cover)?</li> <li>YES = Category I      No ____ Is not a bog for purpose of rating</li> </ol>	<p><b>Cat. I</b></p>

<p><b>SC 4.0 Forested Wetlands</b> (<i>see p. 90</i>)</p> <p>Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? <i>If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>— <b>Old-growth forests:</b> (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more.</p> <p>NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter.</p> <p>— <b>Mature forests:</b> (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.</p> <p>YES = Category I <span style="float: right;">NO <u>X</u></span></p>	<p>Cat. I</p>
<p><b>SC 5.0 Wetlands in Coastal Lagoons</b> (<i>see p. 91</i>)</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p>— The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p>— The lagoon in which the wetland is located contains surface water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p>YES = Go to SC 5.1 <span style="float: right;">NO <u>Y</u> not a wetland in a coastal lagoon</span></p> <p><b>SC 5.1</b> Does the wetland meets all of the following three conditions?</p> <p>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).</p> <p>— At least ¼ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p>— The wetland is larger than 1/10 acre (4350 square feet)</p> <p>YES = Category I <span style="float: right;">NO = Category II</span></p>	<p style="text-align: center;">Cat. I</p> <p style="text-align: center;">Cat. II</p>

Wetland name or number \_\_\_\_\_

<p><b>SC 6.0 Interdunal Wetlands</b> (<i>see p. 93</i>)</p> <p>Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p>YES - go to SC 6.1                      NO ___ not an interdunal wetland for rating</p> <p><i>If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <li>• Long Beach Peninsula- lands west of SR 103</li> <li>• Grayland-Westport- lands west of SR 105</li> <li>• Ocean Shores-Copalis- lands west of SR 115 and SR 109</li> </ul> <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger?</p> <p>YES = Category II                      NO – go to SC 6.2</p> <p>SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?</p> <p>YES = Category III</p>	<p></p> <p><b>Cat. II</b></p> <p><b>Cat. III</b></p>
<p><b>Category of wetland based on Special Characteristics</b></p> <p><i>Choose the "highest" rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered NO for all types enter "Not Applicable" on p.1</p>	<p></p>

# Smith Island Wetland Rating Form

Yellow Polygon  $\leq 6'$  NAVD 88

